Oral Presentation (SA-7)

Os Humerus Amputation in Cat with Osteomyelitis

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INTRODUCTION

Osteomyelitis is bone inflammation caused by infectious agent such as bacteria, fungi, or viruses [1]. Infectious agent attacks part of the bone such as cortical bone, periosteum, and myeloid cavity. Osteomyelitis cases may happen through two causes: hematogenous infection or infection right to the bone after trauma [2]. *Staphylococcus* sp., *Streptococcus* sp., and *Escerichia coli* are bacteria most often cause bone infection [3]. Around 50% of osteomyelitis cases are caused by the bacteria *Staphylococcus* [1]. Treatment for osteomyelitis cases depends on the severity of the case. If it is still mild, veterinarians may only give antibiotic to curb infection. However, on more severe osteomyelitis cases (usually on chronic osteomyelitis), other than antibiotic treatment, debridement or amputation surgery may be performed [4].

Amputation is a surgical procedure performed to separate a part or entire body part or extremities [5]. This procedure is a last option when problems on one part of the body cannot be treated by any other procedure. Several example cases that put amputation as a treatment option are bad blood circulation which cause no blood to sustain the tissues and thus causing tissue death; severe injury (from accidents); tumor/cancer; congenital or acquired defects that cannot be treated; and serious infection that cannot be treated by any other treatment [6].

CASE REPORT

The cat used in this surgical case is a domestic female cat with agouti coat and weighted 2.7 kg. She is a stray living around Laladon Station, Bogor regency. Upon walking, the cat showed antalgic gait. Swelling was found at the distal part of os radius-ulna of left front leg. Palpation on digits and the distal part of left front leg where swelling appeared, cat appeared to be in pain.

Following examination to diagnose the case is by radiograph and laboratory examination. Radiograph examination was done with mediolateral and dorsoventral view focusing on cat's left front leg. The result showed abnormality on the left front leg. Mediolateral (Figure 2a) and dorsoventral (Figure 2b) photos showed that at the distal part of os radius-ulna had uneven margination, appeared more radiopaque, swelled, and had form deformity compared with the right front leg's radius-ulna. Radiopaque mass was found by radius-ulna region. This mass is assumed to be tissues that had changed into connective tissue caused by chronic infection on that part of the leg.

Hematological examination showed significant increase of leucocytes, which signifies infection. The hematological result can be seen in Table 1.

Table 1 Hematology examination result

Blood Parameter	Normal	Unit	Value
Hemoglobin	9.0 – 16.7	gr/dL	11.8
PCV	29.2 – 51.7	%	35
RBC	5.24 – 10.89	Juta/mm^3	4.1
WBC	4200-17500	/mm^3	29800
Lymphocyte	20 – 55	%	29
Band	0 – 3	%	4
Neutrophil Segmented	35 – 75	%	62
Neutrophil Monocyte	1 – 4	%	2
Eosinophil	2 – 12	%	3
Basophil	0 – 1	%	0

Figure 1. Left front leg with swelling

DISCUSSION

Atropine sulphate 0.3% with 0.025 mg/kg BW was given as premedication in subcutaneous injection. Ten to Fifteen minutes after premedication was given, cat was injected by anesthetic xylazine-ketamine mixture per intramuscular in musculus semitendinosus and musculus semimembranosus.

The dosage of each anesthetic injected were 2 mg/kg BW and 10 mg/kg BW. After anesthetized, cat was shaved around planned surgery area. Iodine tincture antiseptic was applied around the surgical region after shaving. After preparation was completed, animal was brought to surgical table and placed in mediolateral position with front left leg on the upper part. Region around surgical orientation was covered by duck cloth and fastened by towel clamp.

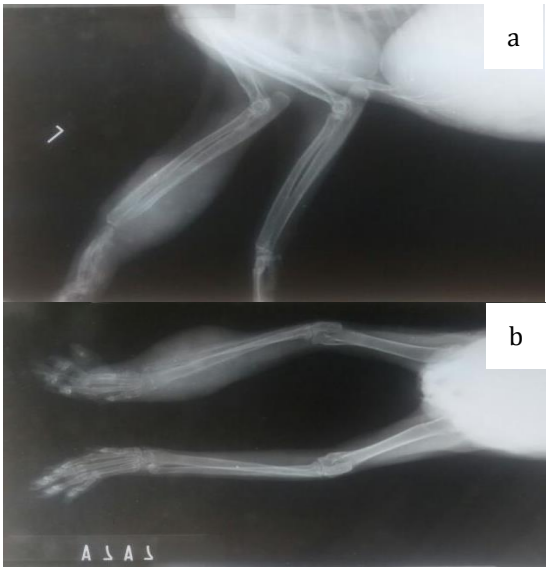

Figure 2. Cat leg radiograph in mediolateral (a) and dorsoventral (B) position

Skin incision started from 1/3 proximal part of os humerus down to medial part of the bone. After muscles were visible, they were incised surrounding os humerus by electrocautery tool with cutting blade while blood vessels were ligated. On lateral region, *m.triceps brachii, m. brachiocephalicus*, cephalica vein, and radialis nerve could be found. In medial region, m. biceps brachii, brachialis artery and vein, and ulnaris nerve could be found. Muscles that had been cut were then opened to reveal os scapularis and os humerus before then separated from each other. After no bleeding was confirmed, the tips of cut muscles were stitched together with simple stitches by using catgut 3/0 thread. Before stitching, liquid 50000 IU/mL penicillin was administered per topical. The skin was then stitched by silk 3/0 thread with horizontal mattress stitch combined with simple stitch method for strengthening purpose.

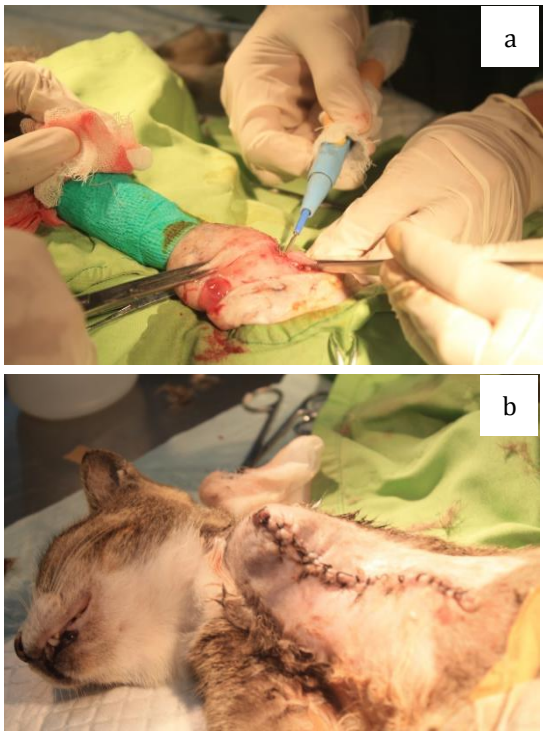

Figure 3. Surgery procedure (a), surgery result (b)

Bioplacenton was administered everyday on stitches wound to increase recovery speed. Amoxicillin clavulanate was given 2 times a day per oral for 5 days. Amoxicillin clavulanate is beta-lactam antibiotic with bactericidal and wide-spectrum properties and can penetrate into bones [7]. Five days post-surgery, cat shows good condition. Surgical wound closed properly with better overall physical condition.

Laboratory examination was done on amputated blood and bone samples. On blood sample, no bacterial infection agent was found. In bone sample, *Staphylococcus aureus* and *Micrococcus sp.* were found. It is highly possible that osteomyelitis happened in this case was caused by *Staphylococcus aureus* bacteria. It is strengthened with the finding of purulent exudate by the cat's leg. Staphylococcus aureus bacteria has been known to be causative agent for infection producing pus [8]. According to [2] osteomyelitis cases by *Staphylococcus* is 74% of all bone infection in small animals. These infections happened directly to the bone and possibly occurred post-trauma. This is supported by the finding of wound around the region of cat's leg swelling.

CONCLUSION

Osteomyelitis cases can be treated by amputation surgical procedure.

REFERENCES

[1] Ettinger SJ, Feldman EC. 2010. Textbook of Veterinary Internal Medicine. Ed ke-7. Missouri (US): Elsevier.

[2] Viskjer S, Rapp M. 2016. Scapular

osteomyelitis in immature domestic shorthair cat. *J Fel Med Sur Open Reports.* 1-5.
[3] Scoot HW, McLaughlin R. 2006. *Feline Orthopedics*. New York (US): CRC Press.
[4] Sykes JE, Kaptkin. 2014. *Canine and Feline Infectious Disease*. Missouri (US): Elsevier.
[5] Fossum TW.2002. *Small Animal Surgery.* Edisi ke-2. Missouri (US): Elsevier Mosby.
[6] Gardiner A, Harari J. 2012. *Amputation: thoracic limb.* http://www.vetstream.com /felis/Content/Technique/teq00661.asp [8 Januari 2013]
[7] Kim BN, Kim ES, Oh MD. 2014. Oral antibiotic treatment of staphylococcal bone and joint infections in adults. *J Antimicrob Chemother*. 69: 309 –322.
[8] Todar K. 2005. *Staphylococcus aureus*. Madison (USA): University of Wiscosin Madison Departement of Bacteriology.